Space Weather Forecast

Issued on Friday, 20 January 2023 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Minor/Moderate Radio Blackouts likely. Slight chance of G1/Minor Geomagnetic Storms through to day 2 (21 Jan).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate through the past 24 hours, with three low level M-class flares observed, two emanating from a small region in the northeast, the other from the remnants of a former region in the southwest of the disc.

No new Earth-directed CMEs have been observed in available coronagraph imagery.

Solar Wind / Geomagnetic Activity: The solar wind speeds were at slightly elevated to background levels. The Interplanetary Magnetic Field increased a little after 19/0400UTC reaching moderate levels. The important north-south component was mostly weakly positive (northward), though with some more sustained negative (southward) orientations between 19/0300UTC and 19/1300UTC. Geomagnetic activity was largely Quiet (Kp 0-2), with Potsdam and NOAA/SWPC recording an Unsettled period 19/0600-0900UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain Moderate, with a slight chance of reaching High levels, with two large and complex sunspot regions on the visible disc the more likely sources of significant flares.

Solar Wind / Geomagnetic Activity: Solar winds currently at background levels. A coronal hole fast wind may connect with Earth during day 1 (20 Jan) into day 2 (21 Jan), this could potentially increase solar wind speeds to elevated levels, although this is low confidence. No CMEs (coronal mass ejections) currently feature in the forecast.

Geomagnetic activity is expected to be Quiet to Unsettled with isolated Active intervals possible, and a Slight Chance of isolated G1/Minor Storm intervals through to day 2 (21 Jan), lowering as any fast wind effects start to wane.

Energetic Particles / Solar Radiation: Solar radiation will most likely remain at background levels, but with a slight chance of enhancements to S1 or greater through the period, in association with any larger flares.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	65	60	60	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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